

OSAC RESEARCH NEEDS ASSESSMENT FORM



Title of research need: Probabilistic genotyping of wildlife STRs using ANSI/ASB Standard 018

Describe the need:

Similar to human STR analysis, mixed STR profiles are possible when processing wildlife forensic evidence. Determining the number of individuals in a wildlife evidence sample, along with their associated STR profiles, can be important in establishing whether a violation has occurred; for example, in most jurisdictions there are take limits on specific species. Currently, most wildlife forensic laboratories do not analyze or report on mixed samples. However, given the development and adoption of probabilistic genotyping software for human STR analysis, it would be valuable to assess and validate such software for use in wildlife forensics, based on ANSI/ASB Standard 018.

Keyword(s): Autosomal STRs, continuous probabilistic genotyping, likelihood ratio

Submitting subcommittee(s): Wildlife Forensic Biology **Date Approved:** 10/7/2022

Background Information:

1. Does this research need address a gap(s) in a current or planned standard? (ex.: Field identification system for on scene opioid detection and confirmation)

No.

2. Are you aware of any ongoing research that may address this research need that has not yet been published (e.g., research presented in conference proceedings, studies that you or a colleague have participated in but have yet to be published)?

No.

3. Key bibliographic references relating to this research need: (ex.: Toll, L., Standifer, K. M., Massotte, D., eds. (2019). Current Topics in Opioid Research. Lausanne: Frontiers Media SA. doi: 10.3389/978-2-88963-180-3)

[1] Taylor D, Bright J-A, Buckleton JS. (2013). The interpretation of single source and mixed DNA profiles. *Forensic Sci. Int.: Genetics* 7:516-528.

[2] Kelly H, Bright J-A, Buckleton JS, Curran JM. (2014). A comparison of statistical models for the analysis of complex forensic DNA profiles. *Science & Justice*, 54:66-70.

[3] Greenspoon SA, Schiermeier-Wood L, Jenkins BC. (2015). Establishing the limits of TrueAllele® casework: A validation study. *J Forensic Sci.* 60(5): 1263-1276.

[4] Coble MD, Buckleton J, Butler JM et al. (2016). DNA Commission of the International Society for Forensic Genetics: Recommendations on the validation of software programs performing biostatistical calculations for forensic genetics applications. *Forensic Sci. Int.: Genetics* 25:191-197.

4. Review the annual operational/research needs published by the National Institute of Justice (NIJ) at <https://nij.ojp.gov/topics/articles/forensic-science-research-and-development-technology-working-group-operational#latest>? Is your research need identified by NIJ?

Yes, under "Assessment of limitations and/or variability of probabilistic genotyping software". However, NIJ does not specify whether this need is specific to human applications or is additionally needed for wildlife forensic applications.

5. In what ways would the research results improve current laboratory capabilities?

The vast majority of forensic laboratories that process wildlife forensic casework currently do not interpret mixed samples, either manually or using probabilistic genotyping software. Assessing the utility and limitations of using such software for deconvoluting autosomal STR profiles for wildlife samples would be highly valuable and could result in laboratories validating such software for routine use in casework.

6. In what ways would the research results improve understanding of the scientific basis for the subcommittee(s)?

The applicability and limitations of using probabilistic genotyping software to analyze mixed wildlife STR samples is lacking and requires further research prior to validation for wildlife forensic casework use.

7. In what ways would the research results improve services to the criminal justice system?

This research would provide new tools to wildlife forensic laboratories for analyzing mixed wildlife samples, increasing the number of cases that can be analyzed and reported on benefiting the criminal justice system.

8. Status assessment (I, II, III, or IV):

I

| | Major gap in current knowledge | Minor gap in current knowledge |
|---|--------------------------------|--------------------------------|
| No or limited current research is being conducted | I | III |
| Existing current research is being conducted | II | IV |

This research need has been identified by one or more subcommittees of OSAC and is being provided as an informational resource to the community.